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"Horizontally Curved Box Beams," Charles E. Cutts (with discussion), 517.

"Influence Lines by Corrections to an Assumed Shape," James P. Michalos and Edward N. Wilson, 113.

"Stresses in Deep Beams," Li Chow, Harry D. Conway and George Winter (with discussion), 686.

"Thin-Walled Members in Combined Torsion and Flexure," Warner Lansing, 128.

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**Bibliography**

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**Bibliography**

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